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ABSTRACT

This course guide for administrators and curriculum planners is intended for use with lesson plans for the instructor and a student study guide, available as VT 019 457 and VT 019 456, respectively. As part of a curriculum package developed by The Center for Vocational and Technical Education after a nationwide survey, this document contains information related to the field of accident investigation, a training plan with a course content outline and model schedule, personnel requirements, facilities and equipment requirements, instructional materials with sample lesson plans, and student study guide and evaluation information. Intended to develop entry-level skills and to train technicians to identify, collect, record, and report data regarding the driver, vehicle, and environment as they relate to the pre-crash, crash, and post-crash phases of an accident, the course consists of five flexible instructional units. Each lesson plan provides teaching procedures, behavioral objectives, and suggested learning activities. A related document is available in a previous issue as ED 069 848. (DE)

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Highway Traffic Accident Investigation and Reporting:

COURSE GUIDE

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December 1972

Prepared for:

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
WASHINGTON, D.C.

FOREWORD

Transportation technology demands information. Most critical in highway traffic are the data and facts required to counter accidents. The Center for Vocational and Technical Education, through representation on the Traffic Education and Training Committee of the National Safety Council (NSC), noted the inclusion of accident investigation in the NSC's monograph *Highway Safety Manpower and Training* (18). Accident investigation was likewise noted in *The Role of the Community Colleges in Developing Traffic Specialists and Technicians* (3), a publication of the American Association of Community and Junior Colleges.

The Center conducted a nationwide inventory of sub-baccalaureate-level programs and training materials related to a variety of highway traffic safety occupations. Among priority needs was training in accident investigation and reporting (5).

The National Highway Traffic Safety Administration (NHTSA) in the U.S. Department of Transportation administers nationally a state and community program referred to as Standard No. 18, "Accident Investigation and Reporting." It was in connection with this program that The Center for Vocational and Technical Education was contracted to plan and conduct an in-service instructor training course (6).

Resource materials on accident investigation techniques from a great variety of sources were evaluated as to suitability for a basic course, for intermediate courses, or for an advanced course.

The *Basic Course: Instructor's Lesson Plans* (8) and the *Student Study Guide* (7) are basic-level accident investigation guides referred to and described in the Course Guide. They were developed in conjunction with the national Accident Investigation Instructor Training Institute.

Robert E. Taylor
Director
The Center for Vocational
and Technical Education

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The project, "Accident Investigation Instructor Training Institute," was directed by Ronald Daugherty, assistant director of Field Services and Special Projects, The Center for Vocational and Technical Education. Project associates were Anne C. Hayes and Sandra R. Orletsky, graduate research associates. Kenneth Spooner, research coordinator, Vocational Education Department, University of Northern Colorado, served as evaluation consultant to analyze the evaluation of the project.*

The project staff was assisted by several individuals in the development of the accident investigation curriculum package, either by planning or through workshop participation. Appreciation is hereby extended to the following persons: Aaron Adams of NHTSA, who served as contract technical manager; regional workshop consultants Bernard T. Fagan, associate professor of trade and industrial education, University of Kentucky, Carroll Hyder, assistant professor, Department of Industrial Education, East Tennessee State University, and Ivan Valentine, professor of vocational research, Colorado State University; Richard Fredericks and John Keryeski from NHTSA who contributed to the technical review; and Sgt. D. G. Slemmer of the Ohio State Highway Patrol Academy, who contributed to the curriculum package and to the final technical editing.

The names of the 64 state and local instructors who represented 35 states at the regional workshops appear in the Appendix. These instructors also contributed to the original draft of the *Instructor's Lesson Plans* for the curriculum package.

The local host institutions for the five workshops were:

- The Atlanta Area Technical School, Atlanta, Georgia
- West Campus, Denver Community Colleges, Denver, Colorado
- City College of San Francisco, San Francisco, California
- William Rainey Harper College, Palatine, Illinois
- Manchester Community College, Manchester, Connecticut

The technical reviewers of the *Instructor's Lesson Plans* were selected from the participants at the five workshops. They were: Glenn E. Clark, Karl Hutchinson, John Knight, H. Wayne Overson, Wayne Seal, and Irvin B. Smith. Photographs are courtesy of the State Highway Patrol of the Ohio Department of Highway Safety.

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* Information about this project can be found in Daugherty, Ronald D.; Hayes, Anne C.; and Orletsky, Sandra R. *Accident Investigation Technician Instructor Training Institute-Final Report.* Washington, D.C.: National Highway Traffic Administration, 1972. Available from the National Technical Information Service.

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HIGHWAY TRAFFIC ACCIDENT INVESTIGATION AND REPORTING: COURSE GUIDE

ACCIDENT INVESTIGATION

Function. The growing need for accident investigation technicians in the United States has been established by various federal, state, and local government and law enforcement agencies. The manpower estimates for accident investigation technicians by 1977 are for 12,000 full- or part-time persons employed by state or local agencies (*Highway Safety Occupational Program Development Guide* by Daugherty, Brooks, and Hyder, July 1971).

In recognizing the need for a coordinated highway safety effort, the Highway Safety Program Standard No. 18, "Accident Investigation and Reporting," has been developed by the U.S. Department of Transportation (Appendix). The new standard calls for all states to develop uniform comprehensive systems for the collection of traffic accident data. The training of basic-level accident investigation technicians to identify, collect, record, and report the cause of accidents is an essential phase of the overall highway safety program.

The new Standard No. 18 made it necessary to locate substantive resource materials on accident investigation and reporting at the basic level. The principal sources tapped in the search for these materials were unpublished as well as published studies conducted under auspices of the National Highway Traffic Safety Administration. These studies consist of: (1) a task analysis for accident investigation technicians conducted for the National Highway Traffic Safety Administration by Battelle Memorial Institute, Columbus, Ohio, and (2) the training course materials developed by the Cornell Aeronautical Laboratory for training multidisciplinary teams of accident investigators.

Other principal sources utilized in developing the curriculum model were: the investigation and reporting procedures for the extensive files of incoming reports housed in the NHTSA, an analysis of the performance skills required, and course materials used in the training of the national research network of "multidisciplinary go-team" investigators. Complete references are to be found in the *Accident Investigation Technician Instructor Training Institute-Final Report*, available from the National Technical Information Service (6).

Figure 1 illustrates the adapted NHTSA model developed to train a basic-level accident investigation technician. The following is a description of the model.

There are:

1. Three phases of accident investigation, consisting of pre-crash, crash, and post-crash
2. Three components of accident investigation, environment, vehicle, and driver

3. Four functions of the basic-level accident investigation technician, involving the skills necessary to identify, collect, record, and report (15)

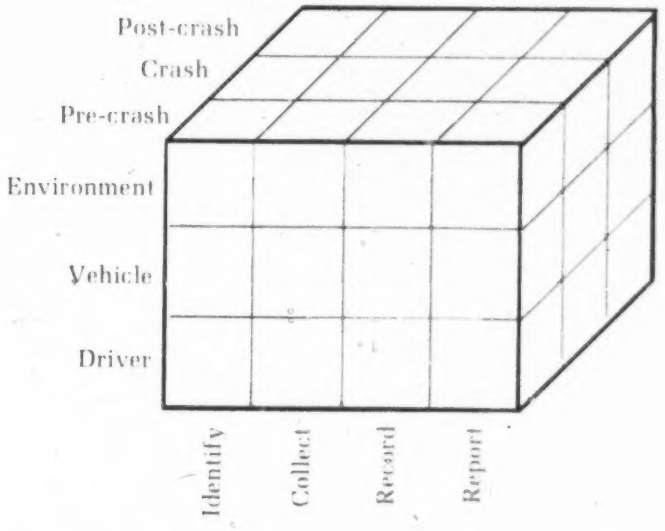
Information gained about the pre-crash phase contributes to understanding accident avoidance, that gained about the crash phase contributes to injury prevention, and the knowledge learned about the post-crash phase helps reduce the severity of accidents.

Skillfull identification provides quick and complete surveys and analysis of complex situations. Selected items and conditions are accurately designated and defined. Skillfull collection requires priority decisions and results in the quantification and qualification of accident information times, frequencies, amounts, and distances. Skillful recording provides input materials to allow the preparation and presentation of summaries of investigations of accidents. Field notes, sketches, and photographs are required documentation. Skillful reporting provides the end product or service. Oral briefings or written documentation are invaluable to understanding and allow continuing efforts for reduction of fatalities, injuries, and property damage.

Current literature in the field of accident investigation and reporting describes practices from the crudest to highly scientific computer modeling. This, along with the logical roles of the several agencies in both the private and public sectors, was considered in the determination of scopes and content of a basic-level course in accident investigation and reporting.

Manpower. It proved relatively easy to identify numbers of scientists and researchers, engineers, educators, and other authorities in the field. Labor force inventories and projections dealing with nonprofessional, i.e., technical manpower, applied man-year equivalencies or levels of effort rather than head-count data. Accident investigation and reporting was found at present to be a function within a broader function such as law enforcement. Police officers, among other duties, do accident investigation. A number of jobs or positions, such as traffic engineering technicians and emergency vehicle dispatchers, require, among other skills, a high degree of one or more accident investigation skills.

FIGURE 1
Matrix for Highway Traffic Accident Investigation and Reporting Curriculum

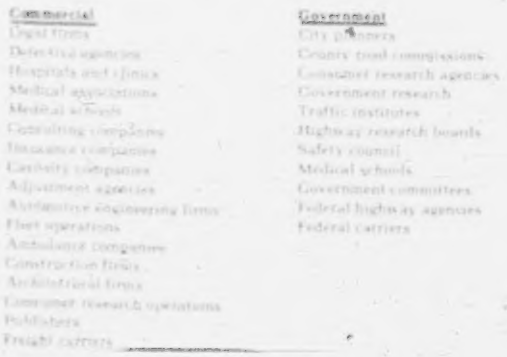


An additional type of job classification may be observed in public service or governmental agencies. It includes such positions as intern, assistant, or aide. Qualifications are comparable to the police patrolman, the emergency medical technician, the driver license examiner, traffic records, programmer, and others. It is for such in-service state and local agency personnel that training in skills of basic-level accident investigation and reporting will prove most beneficial.

Potential employers for accident investigation technicians can be found in four general areas: public service, commercial, manufacturing, and government. A partial listing of potential employers in each area might be as follows:

Public Service
Insurance boards
State police
Local police
City planners
Highway departments
Hospitals
Ambulance companies

Manufacturing
Automotive manufacturers
Parts manufacturers
Tire manufacturers
Automotive suppliers
(glass, chemicals, systems, etc.)



Instructor Institute. A series of five regional instructor training institutes were conducted during the spring of 1972. The two overall purposes of the workshops were curriculum materials development and the improvement of participants' teaching skills. There were a total of 64 workshop participants representing 35 states. These individuals were primarily involved with some phase of police training, police science, accident investigation, and traffic engineering programs at community colleges, police academies, or state highway patrol academies. The average participant had slightly more than four years of accident investigation experience in addition to four years of teaching experience.

Of the 35 modules illustrated in the Figure 2 model, numerous modules isolated skills that obviously were identical to skills required of qualified police traffic patrolmen, although often at a higher level of sophistication than required to meet the objectives of this course. It was for this reason that instructional personnel, law enforcement programs of selected community colleges, and police academies were requested to contribute their skills and experience to the further development of lesson plans and student materials for this basic course. It required, in many instances, that new, different, and additional lesson material be developed and substituted for familiar long-established lesson units that emphasized the law enforcement function.

The schedule used to develop curriculum materials was as follows: (1) develop a curriculum model to include all available data and project objectives, (2) develop a proposed course content outlined for curriculum, (3) establish criteria and select teacher educator consultants, (4) establish criteria and select workshop participants, (5) plan and conduct five regional workshops to develop assigned lesson units, (6) edit and revise draft lesson units, and (7) plan and conduct the follow-up technical editing workshop.

TRAINING PLAN

Purpose of the Course Guide. This publication has been prepared in order to assist administrators and curriculum planners in organizing and conducting a course for basic-level accident investigation technicians. Included in the *Course Guide* is information related to the field of accident investigation, a training plan with a course content outline and model schedule, personnel requirements, facilities and equipment requirements, instructional materials with sample lesson plans, and student study guide and evaluation information. The Bibliography is limited to publications selected as being most significant to the course planning responsibility. The Appendix contains further accident investigation-related information such as Highway Safety Program Standard No. 18.

Objectives. The curriculum package has two major objectives: (1) to develop the skills essential for an accident investigation technician to possess for a basic-level position and (2) to train basic-level accident investigation technicians to identify, collect, record, and report data regarding the driver, vehicle, and environment as it relates to the pre-crash, crash, and post-crash phases of an accident.

The technical functions are performed most effectively when an understanding and appreciation of related theories and knowledge are possessed.

The course is designed to emphasize the skills of investigation while avoiding direct involvement with actual accident situations, vehicles, or drivers. It is not dependent upon legal authority nor requirements to present evidence in court. On the other hand, provision is made through a Job Activity Sheet for trainees who, in the normal course of performing their work, have occasion to apply skills in an actual accident situation. The course assumes the trainee possesses normal abilities and understandings of the psycho-physical nature of humans and the common performance characteristics of vehicles, and that he is familiar with the system of urban and rural streets and highways.

The demonstration nature of the training precludes extensive treatment of theoretical materials or any but routine investigative functions. Examples are alcohol blood-equivalent testing and speed calculation by test skids.

Limitations. The content of the curriculum is geared to train personnel for basic-level accident investigation technician positions. Therefore, the curriculum is not appropriate for training higher

level technicians, such as experienced members of multidisciplinary accident investigation teams.

A further limitation is imposed by the fluctuating "state of the art" of accident investigation, which provides parameters within which this curriculum package must fit. Although this curriculum package is designed to teach the skills of accident investigation, it is not necessarily intended to be law enforcement-oriented. This orientation may pose some problems in implementing the curriculum at some institutions.

Course Content. The accident investigation course is organized to provide instruction in skills associated with facts and information identification, collecting, recording, and reporting. (See Figure 2. The course outline corresponds to the curriculum model previously described in Figure 1.)

The course consists of five lesson units involving a flexible number of training hours. The hours requirement was designed to be unspecified in order to provide the maximum flexibility for the curriculum. The first unit serves as an overview of the highway transportation system, emphasizing the purposes, responsibilities, and objectives of the accident investigation technician, as well as provides a general introduction to planning the investigation.

The second unit stresses the identification function of investigation as it relates to the driver, vehicle, and environment in examining for pre-crash, crash, and post-crash contributory conditions and causes as well as determining definitions and classifications.

The third unit emphasizes the learning of the skills an investigator must have in order to collect data through interviews, mea-

surements, photography, and determining speed estimates.

The fourth unit introduces the methods of recording accident data gathered through photography, field sketches, and interviews.

The fifth unit emphasizes concepts involved in accident reconstruction, reporting the investigation of an accident, and preparing and presenting the accident report.

Lesson Plans. The lesson plan topics are oriented to teacher and student activities, stressing skills required for an accident investigation technician to possess when identifying, collecting, recording, and reporting the necessary data as it relates to the driver, the vehicle, and the environment. The final lesson provides a simulated (mock) accident investigation situation in which the student can demonstrate the technical skills he has acquired through the course.

Each lesson provides an application phase to insure that the student becomes actively involved in the learning process.

The training class can be exposed to real life traffic accidents at the discretion of the instructor.

The course may be offered in conjunction with other courses in major areas, such as law enforcement, automotive, civil engineering, emergency medical care, etc.

Figure 2 presents a detailed outline of the course content for traffic accident investigation technician training as offered in the *Instructor's Lesson Plans*. A descriptive statement for each lesson topic can be found in the *Student Study Guide*.

FIGURE 2

Course Content Outline for Highway Traffic Accident Investigation and Reporting: Basic Course

LESSON

Introduction

1 Highway transportation system
2 Purposes, responsibilities, and objectives of the accident investigator
3 Plan the investigation

Identify

4 Definitions and classifications

The driver

5 Identify the driver
6 Identify pre-crash conditions of the driver, with reference to alcohol/drugs
7 Identify pre-crash and post-crash conditions of the driver, with reference to emotions, fatigue, and physical illness
8 Identify behaviors as driver personality and attitude
9 Identify natural abilities of the driver
10 Identify learned capabilities of the driver
11 Identify persons other than the driver as potential sources of information

LESSON

The vehicle

12 Identify vehicle types and components
13 Identify pre-crash, crash, and post-crash vehicle damage and defects
14 Identify sources of injury to occupants and/or pedestrians

The enviornment

15 Identify and determine environmental atributes
16 Identify pre-crash marks on the roadway, shoulder, and environment
17 Identify position and angle of infliction
18 Identify debris
19 Identify vehicle parts with crash marks on the roadway & surrounding environment
20 Identify area of impact from marks on the roadway
21 Identify post-crash roadway marks in relation to the accidents

Collect

22 Pre-crash and post-crash actions and reactions

LESSON

23 Interview
24 Collect and preserve physical evidence
25 Make relocation measurements
26 Photograph
27 Make speed estimates

Record

28 Introduction to methods of recording data
29 How to record via photography
30 How to record via field sketches
31 How to record via notes from interviews

Report

32 Reconstruction principles and causation analysis
33 Report the investigation of an accident
34 Prepare and present the accident report
35 Simulated (mock) traffic investigation

Model Schedule. Seventy hours of instruction are suggested. This represents the equivalent of a one-semester course with two-hour sessions twice each week. Figure 3 presents a model with hours assigned to classwork and laboratory or field work.

FIGURE 3

Highway Traffic Accident Investigation and Reporting Curriculum Model Schedule

HOURS		UNITS	LESSONS
Classwork	*Lab or Field Work*		
1		Introduction	1-3
3	8	Identification	4-21

HOURS		UNITS	LESSONS
Classwork	*Lab or Field Work*		
5	13	Collection	22-27
5	13	Recording	28-31
5	12	Reporting	32-34
1	4	Summary and Completion	35
20	50		

Provision is made for in-service students whose routine duties provide real life experiences in one or more of the investigative skills, e.g., photographing accidents. Validated entries in the course's Job Activity Sheet may be substituted for laboratory or field work exercise. [See Student Job Activity Sheet, Figure 5.]

Methods of Instruction. The curriculum package is designed to assist the instructor in teaching the skills and knowledge necessary for the preparation of basic-level accident investigation technicians. It is emphasized that teaching should consist mainly of demonstration, with learning occurring through application and practice. Each lesson plan has a specific set of behavioral or performance-based objectives that attempt to encourage learning through student activity.

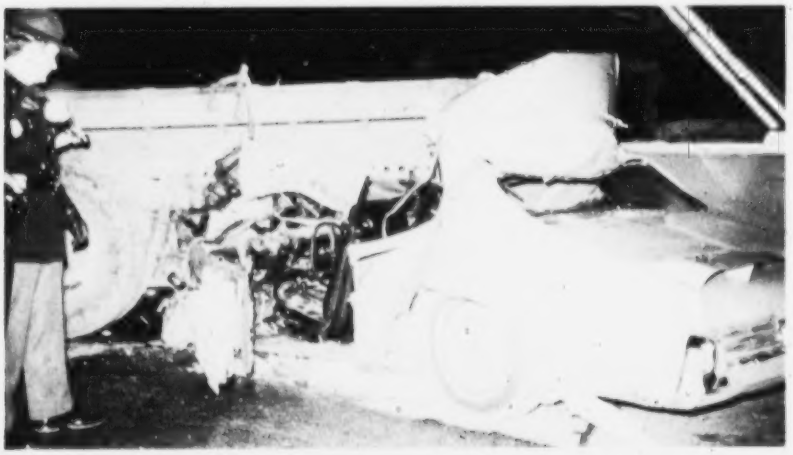
The lessons are not designed to be a complete blueprint or "how-to-do-it," step-by-step manual but are the best available expert suggestions for teaching the skills and knowledge necessary in the accident investigation field.

The curriculum materials are designed to meet the needs for preparing an individual for a basic-level accident investigation position. The objectives for each lesson plan are written in behavioral terms in an effort to reinforce the concept of learning through student-oriented activity as opposed to teacher-oriented activity. Included in this guide is a Job Activity Sheet that can serve as an individual progress chart for each student as he masters the skills necessary for basic-level accident investigation technician.

Reading references are identified for those students who desire in-depth study. Independent study may be required, depending upon the background the student brings into the course.

The authors envisioned something other than the traditional setting of the classroom when designing this curriculum. Mock simulation settings of traffic accidents, junk yards, and field trips were viewed as more effective settings for the successful implementation of this curriculum. While the nontraditional classroom

poses more of a problem for the instructor than the student, it was felt that this different and activity-oriented setting would do more to encourage and motivate the student to learn the lesson material through an application process. Much of the effectiveness of the course depends upon field work and group tours conducted to provide extemporaneous observations and narration.



Use of Lesson Plans. All lesson plans in the *Instructor's Lesson Plans* are designed to serve as guidelines for the instructor to use in teaching the 35 lesson topics on accident investigation. Creative approaches and innovations in teaching techniques are encouraged in an effort to stimulate learning and motivate the student. The objectives of each lesson unit have been written in behavioral terms. The lesson plans, therefore, reflect a student orientation and not necessarily an instructor orientation. Wherever possible, student activity and involvement are suggested. While the traditional lecture method is the easiest for the instructor to rely upon, the most effective learning occurs when the student is motivated through involvement in action-oriented activities. Learning by doing rather than learning by telling is a guideline suggested for this curriculum.

By informing the student at the outset of the instructor's objectives for each lesson unit, both the student and the instructor can work together to accomplish the stated objectives.

PERSONNEL

Instructor's Characteristics. Instructors for the course should ideally possess prior experience and knowledge in the various areas of accident investigation. The course is designed with student performance of specific skills as a major objective. Therefore, it is essential that instructors of these curriculum materials be able to perform at least at the proficiency level desired of the trainee.

Instructors should be geared to helping students learn by expressing interest and offering guidance when necessary. Instructors should be committed to the philosophy upon which this curriculum is predicated. Specifically, this means that the learning process is enhanced by actively involving the student in curriculum-related activities as contrasted with the traditional lecture approach.

An unusual burden is placed on the instructor by making it necessary to identify, arrange, and utilize training resources that, though typical, are unique to a given community, e.g., traffic courts, frequent crash sites, and crash damaged vehicles. An energetic and imaginative individual is essential as instructor. A background of firsthand observations of crash occurrences and the aftermath in a variety of situations under differing conditions would permit the instructor to lend realism and practicality.

Course materials contain a minimum of reference to teaching methods and techniques. It is recommended that the instructor will have completed a course comparable to that published by the U.S. Office of Education, *Preparation of Occupational Instructors.*

The Accident Investigation Technician Instructor Training Institute conducted by The Center for Vocational and Technical Education provided an opportunity for educators and non-educators to utilize behavioral objectives in developing curriculum materials as well as experience methods designed to improve teaching skills. Findings and supplemental materials can be found in the final report available from the National Technical Information Service.

Student's Characteristics. The course is developed with basic-level personnel in mind, although nothing precludes offering it as in-service training. The student must be capable of relating to people (driver) and understanding vehicle construction and performance (vehicles), and be familiar with typical streets and highways (environment). Beyond that, he must possess an aptitude for producing legible paper and pencil work, facility with the camera he will use, and ability to express concepts and ideas both orally and in writing.

The student is required to practice and perform the training tasks under conditions that often may be inconvenient, if not uncomfortable. Many of the units require that he sincerely play the role of an accident subject, a role that involves interviewing and simulating driver behavior and victim injuries.

The basic course provides only that the student deal with objectives and factual information. He will not be involved in assessment of courses, agency jurisdictional policies and practices, or implications of legality. It may be expected that the student will work under the direction of personnel, such as physicians, prosecutors, engineers, and policemen, whose authority and responsibility encompass such complexities.

FACILITIES AND EQUIPMENT

Course arrangements are based on the assumption that a classroom will be required. It will serve as a staging area and provide space for briefings, paperwork, and practice with equipment and instruments.

In general, drivers, vehicles, and roadways, which are always and everywhere at hand, will provide training resources. There is no necessity for the training groups to be involved in real life traffic accidents. Training in the skills, however, requires that drivers and driving behavior be observed and analyzed, that crash-damaged vehicles be studied, that injuries be noted, and that typical local highway characteristics and configurations become familiar. Field work under tightly controlled conditions is an essential requirement in meeting the objectives of the course. Arrangements with auto wrecking concerns, garages, street departments, ambulance crews, and court authorities are limited only by local ingenuity.

Standard classroom equipment is required, including chalkboards, opaque projectors, tape recorders, and increasingly common portable TV camera and playback equipment.

The identification unit of the course will require handbooks, specification charts, blueprints, labeling, and marking devices.

The collection unit of the course will require such measuring instruments as tape lines, marking crayons, labeling and marking devices, camera, specimen containers, and a watch. The recording unit will require sketch pads and sketching equipment, notebooks, camera, tape recorder, report form blanks, typewriters, and copying machines. The reporting unit will require drawing equipment models and mockups, maps, typewriter, and projection equipment.

Sufficient transportation for the class must be scheduled when field work involves travel to designated sites in the locality and for frequent observation and monitoring tours.

INSTRUCTIONAL MATERIALS

Instructional materials are the published *Basic Course—Instructor's Lesson Plans* and the *Student Study Guide*. Great reliance is placed on the individual local instructor to search out and inventory meaningful current material to enrich each unit. Examples are photographs, slides, film specimens, investigation files and reports, and report forms. Locations for field work will have to be identified, arranged, and scheduled.

The instructor may be expected to possess an assortment of textbooks in the field of accident investigation. Required outside

reading is at a minimum but should be available to students who (1) possess less than usual experience or knowledge of driver, vehicle, or roadway, (2) desire to study theoretical aspects of accident investigation, or (3) desire to study specific applications to a particular jurisdiction or agency, such as police testimony in court cases.

Instructor's Lesson Plans. A lesson plan is provided for each of the 35 units of the course. The plans are organized in a uniform format to provide ready familiarity to the instructor throughout the course and to be convenient to follow while actually teaching.

Lessons are of two types—the manipulative skill lesson and the related technical information lesson. In both instances, lessons are organized for presentation in a sequence of phases or steps: (1) preparation of the learner, (2) presentation, and (3) application with suggested activities for student evaluation. (See an example of a lesson plan sheet in Figure 4.)

Published material references in most lesson plans are included to assist in the instructor's personal development and review. They are not intended for student reading assignments. Entries are limited to those readily obtainable by the instructor.

FIGURE 4

LESSON PLAN 2

UNIT: Introduction

LESSON PLAN TOPIC: Purposes, Responsibilities and Objectives of the Accident Investigator

OBJECTIVES: The student will be able to:

1. Explain the purpose of an accident investigator at the scene of an accident to the instructor's satisfaction.
2. List the basic responsibilities of the accident investigator as outlined in the lesson.
3. Explain the objectives of an accident investigator with the use of the four "E" concept.

PREPARATION OF THE LEARNER:

If you do have the responsibility for investigating traffic accidents, you will need to examine the accidents systematically and with some professional skill. We know that:

1. All accidents are made up of a series of events.
2. Certain links in this series of events are very important to determine the cause.
3. It is hard to talk about the cause because, at times, there is more than one cause.

Highway and traffic pattern improvement must be based upon accurate, factual information. But you cannot gather this information unless you know the part you are to play in the total traffic safety team. For you to perform efficiently you must

know what your job is before the emergency arises.

Can you visualize this accident scene?

1. You are the investigator with no formal training.
2. It is 11:15 p.m. and you go off duty at 11:30 p.m.
3. You arrive at the scene of the accident at the edge of the city limits.
4. The cars are smoking.
5. You see three motionless bodies.
6. There are three injured persons pinned in the vehicle.
7. The highway is blocked.
8. Bystanders are asking questions and making suggestions.

What training do you need?

1. *P Purpose* Why are you there?
2. *R Responsibilities* What are you trying to do?
3. *O Objective* What are you trying to accomplish and why?

Are you a PRO investigator? You can be! Let's discuss these questions.

PRESENTATION:

I. As a group discuss the following:

A. What is the *Purpose* of the Investigator?

Why are (you, we) there?

1. Statute requirements to investigate:
   a. Death
   b. Injury
   c. Property damage extent as required by law or where one vehicle must be towed away (National Standard)
   d. State law
   e. City ordinance
   f. County regulations
   g. Law requirements
2. Departmental policy or procedure:
   a. Rules set out in your department regulations
   b. Special needs
3. Investigation:
   a. It is a careful and systematic inquiry into the facts and circumstances of accidents to discover causes.
4. Determination of the cause:
   a. Not really an accident.
   b. Not an act of God.
   c. There is a cause or causes.
   d. We do not have to accept accidents as the price of convenience of the automobile.
   e. Accidents can be prevented.
   f. Accidents are the result of certain unexpected causes.

B. What are the *Responsibilities* of the accident investigator?

What are you going to do?

1. Proceed to the scene quickly but safely.
2. Secure accident-facts.
   a. In writing
   b. In sketching
   c. In photographing
   d. In interviews
3. Identify, collect, record and report all pertinent evidence

4. Meet state and local requirements.
   a. Statute laws
   b. City ordinances
   c. County ordinances
   d. Departmental policy and procedure
   e. Supervisor's requirements

C. What are the *Objectives* of the accident investigator?
   What are you trying to do as an accident investigation technician and why?
   1. Enforcement
      a. A complete investigation will suggest:
         (1) Cause(s) of the accident
         (2) Violations of law
         (3) Evidence facts for use in court against violator
   2. Education
      a. Complete investigation will suggest needs for:
         (1) Driving improvements
         (2) Hazard driving areas
         (3) Basic needs for education in driver improvement areas
   3. Engineering
      a. These professionals use our investigative information to:
         (1) Locate problem areas.
         (2) Determine where engineering work needs to be focused.
         (3) Make their study of the problem location.

APPLICATION:

Instructor: Use a transparency, chalk board, or felt board, etc., and have students summarize the purpose, responsibilities, and objectives of the accident investigator.

1. Display a "P" and ask students:
   a. What does the *P* of *PRO* represent? (Purpose)
   b. Why are you at the accident scene? (Reconstruct the Purpose as set out in outline)
2. Display an "*R*" and ask students:
   a. What does the *R* of *PRO* represent? (Responsibilities)
   b. What are you going to do at the accident scene? (Reconstruct the Responsibilities as set out in the outline)
3. Display an "O" and ask students:
   a. What does the *O* of *PRO* represent? (Objective)
   b. Now that you are at accident scene, what are you going to do and why? (Reconstruct our objective from the outline)
4. What are the (4) four "E"(s) relating to accident investigation? (Place 4 "E" on board.)
   a. Ask students to name each, put the word on felt beside an "E" and ask students to describe how accident investigation technicians assist in each.
      (1) E Enforcement
      (2) E Enactment
      (3) E Education
      (4) E Engineering

4. Enactment
   a. Result of our investigation the lawmakers determine:
      (1) Need for additional laws
      (2) Revisions in present laws
      (3) Legislation that is more applicable to problem
      (4) Research basis for traffic records systems to several state local agencies (e.g., motor vehicle administration, public health—emergency medical and highway department)

SUGGESTED REFERENCES:

1. Baker, J. Stannard. *Traffic Accident Investigator's Manual for Police*. Evanston, Illinois: The Traffic Institute, Northwestern University, 1971.
2. *Military Police Traffic Control Supervision*. Fort Gordon, Georgia.
3. Your State Statutes, City, and County Ordinances (Traffic Laws).

Student Study Guide. The student is provided the statement of the course objectives, the course outlines of lessons, the statement of lesson objectives, the assigned application, and the criteria for student accomplishment. Equipment, tools, and supplies are indicated.

As the course progresses, loose-leaf handout sheets can be provided by the instructor for inclusion in the *Student Study Guide*.

A feature of the *Student Study Guide* is the Job Activity Sheet, which provides those students who have the opportunity to put the skills of the course into use outside the class and to confirm and record the experience for recognition by the instructor and employer. (See Figure 5.)

Instructor-Developed Aids. While a variety of visual aids and equipment could be used to augment the lesson units at the discretion of the individual instructor, the development and use of supplemental information has been left up to the individual instructor. Some suggested equipment and visual aids are included with the lesson topics in the *Basic Course—Instructor's Lesson Plans*.

Much of the graphic arts material, such as charts and graphs, rapidly becomes obsolete. The same may be said for photographic materials. The instructor will find many sources in pamphlets, journals, and newspapers. For greatest effectiveness, material should use local drivers, vehicles, and highways so they will be familiar to the student. Exceptional items of student work from previous classes provide a rich store of instructional material for future use. Any slide collection used should be continuously extended and updated.

Reference Text Materials. No one specific textbook has been selected for use as an instructor's or student's reference in implementing the highway traffic accident investigation and reporting

curriculum. The instructor may recommend in specific cases that a student do study or research from a textbook that is readily available. There are a number of recommended commercially available texts that could be used to supplement curriculum development. References from J.S. Baker's *Traffic Accident Investigation Manual* have been cited for student use in connection with the *Basic Course—Instructor's Lesson Plans*. These suggested texts are listed in the Bibliography of the *Course Guide*.

TRAINING EVALUATION

Evaluating the student's performance to ascertain whether he has met each objective can be accomplished in several ways. Each lesson topic has incorporated within it some form of application activity to determine an adequate performance level. There has been a concerted effort to restrict the use of the traditional true-false, multiple-choice, or essay examination in this suggested curriculum. However, some topics more readily lend themselves to creative, nontraditional performance-level testing than others. The instructors are encouraged to use the application activities or performance techniques suggested in the lesson units rather than rely upon the standard testing methods.

The success of the course is determined by the ability of the student, upon employment, to deliver a product of a stated quality in an appropriate period of time, i.e., correct identification, accurately collected measurements, a legible sketch, or a factual written report. This is differentiated from the testing of the student's retention of information or knowledge.

The Job Activity Sheets allow evaluation of the student's product or accident investigation process. The course should be analyzed and evaluated at intervals to confirm that three factors are operating satisfactorily. Those factors are that: (1) the course content is appropriate for the aptitudes and abilities of the trainees; (2) only trainees who are capable of achieving the course objectives are enrolled; and (3) the instructions, including the facility and equipment, are all conducive to the anticipated learning and performance.

Provisions have been made for evaluating both the instructor and the course through the use of the Student Opinion of Teaching and Course Evaluation Form. This form can be found in the Appendix of each document in the curriculum package. The suggested use of this form is primarily for course revision over improvement of instruction.

A local advisory committee will prove very effective in not only evaluating the training course but also in providing initial guidance and continuing support.

FIGURE 5

Highway Traffic Accident Investigation and Reporting: Job Activity Sheet

Student Name: _____

Instructor: _____

Assigned Activities*	Student Description of Activity as performed (attach necessary evidence)	Date Completed	Instructor Comments and Evaluation
Lesson 14: Examine and Identify Pre-Crash, Crash, and Post-Crash Vehicle Damage and Defects Analyze a designated number of vehicles for the purpose of identifying contact and induced damage and distinguish between multiple impacts.			
Lesson 17: Identify Pre-Crash Marks on the Roadway, Shoulder, and Environment Identify through photography the following types of pre-crash marks as found on the roadway/highway: a. Skidmark b. Scuffmark c. Centrifugal skid mark d. Impending skid mark e. Tire shadow mark f. Furrow g. Squeegee mark h. Erasure mark i. Overlapping skid mark j. Skips k. Test skids			
Lesson 23: Pre-Crash, Crash, and Post-Crash Actions and Reactions Submit in narrative form the reconstruction of the crash from the first point of perception to the final position of the involved vehicles.			

*These examples have been selected from the *Highway Traffic Accident Investigation and Reporting: Student Study Guide*

FIGURE 6

LESSON PLAN 26

UNIT: Collect

LESSON PLAN TOPIC: Relocation Measurements

OBJECTIVES: The student will be able to:

1. Identify if the measurements at an accident are of positions which are temporary or short-lived in nature.
2. Utilizing a mock traffic collision scene or scale diagram, each student will demonstrate to the instructor's satisfaction, two methods of making relocation measurements, including how, from what point, and to where they should be made.

PREPARATION OF THE LEARNER:

The recording of relocation measurements for a sketch of the collision scene is one of the important functions of an accident investigator in conducting a systematic inquiry into a traffic collision. Proper planning and sketching information is necessary to provide uniformity in reports and to avoid useless detail.

Careful measurements take the guesswork out of locating positions of objects at the scene. Reconstruction of the events of an accident from the first point of perception to the final position of the involved parties is derived from the measurements made by the investigator either at the accident scene or other locations as required.

PRESENTATION:

I. Need for Relocation Measurements
   A. Remove guesswork by recording measurements made at the scene.
   B. Reconstruction of an accident scene.
      1. For purposes of recording information
      2. For purposes of obtaining evidence

II. What to Measure
   A. Purpose
      1. To be able to relocate the position on a trafficway at a later date if it becomes necessary
         a. Reminder—it is always better to have too many measurements than to need one later and not have it.
   B. Important measurements
      1. Point of impact
      2. Physical evidence
         a. Skid and tire marks
         b. Debris
         c. Other factors relating to the collision
            (1) View obstructions, etc.
      3. Final position of vehicles or injured person

III. When to Measure
   A. Procedure
      1. Determine if the measurement needs to be made.
      2. Determine the type of evidence present.
         a. Temporary in nature—last only few minutes
         b. Short-lived in nature—may last hours or even days
   B. General
      1. Taking measurements is only part of important duties at the scene.
         a. Measurements may have to be taken after other duties completed.
      2. Temporary evidence should be taken first.

a. Chalk or crayon may be used to mark the evidence until it can be measured and recorded.

3. Check the scene before departing to insure all measurements have been taken.

IV. Equipment

A. Materials

1. Tape measure
2. Procedures for pacing measurements
3. Visual measurements
   a. Known measurements of objects present at the scene may be used—Example:
      (1) The white (broken) lane lines are nine (9) feet in length with a fifteen (15) foot space in between.
      (2) The reflective wedges are forty-eight (48) feet apart.
4. Material by which to record measurements

V. Measuring Distances

A. General

1. Decide what is to be measured.
2. Have necessary tools available to accomplish task.
3. Have adequate traffic control to assure safety of investigator.

B. Procedure

1. Short distances
   a. Use a pocket-type tape.
   b. Pacing method.
2. Long distances
   a. 100-foot tape
   b. Pacing method
   c. Odometer of vehicle

VI. Accuracy of Measurements

A. The measurements taken are only as good as the accident site investigator and his tools.

2. The measurements may be used in court.
   a. The investigator will have no problems in court if accurate notes are kept.
   b. Measurements may be checked by a second person when they are made to insure accuracy.

B. Errors in measuring devices

1. Time and temperature affect devices—Example:
   a. A steel tape will have a two (2) inch error in 100 ft. when new.
   b. A cloth tape will have a three (3) inch error in 100 ft. when new.
   c. A steel tape will lengthen ¾ of an inch in a temperature change from 0 to 100° Fahrenheit.

C. Errors made by investigator

1. Most errors are made by carelessness.
   a. Mis-reading numbers
   b. Losing count of the number when making long distance measurements

VII. Methods of locating evidence

A. Points of reference

1. Always use a permanent object to measure from.
   a. Mile post marker
   b. Edge of roadway
   c. Center line (or lane line)

d. Curb edge
2. Do not use objects that are not of a permanent nature
a. Telephone or power poles
b. Mail boxes
c. Edge of driveways
d. Apex of a corner with no curbing

B. Location by coordination
1. Refer to a sample sketch on a transparency or draw a sketch on the chalkboard using the coordination method.
2. Coordination method used to eliminate clutter when there are too many measurements.
a. Letters are used instead of numbers at the location on the sketch for a measurement.
b. A legend on the sketch contains the measurements.
3. Complicated method of measuring.

C. Location by triangulation
1. Refer to a sample sketch on a transparency or draw a sketch on the chalkboard using the triangulation method.
2. The triangulation method uses triangles to connect each spot with two permanent objects.
a. Separate triangle for each point to be measured.
b. Avoid slender triangles.

D. Location by reference point
1. Refer to a sample sketch on a transparency or draw a sketch on the chalkboard using the reference point method.
2. The reference point method is the most common type used.
a. Simple to use
b. Prevents confusion
3. Measurements are taken from a permanent point and then all other measurements are made from that point.

VIII. Recording Measurements
A. Record measurements as they are made.
B. Identify measurements on a field sketch.

APPLICATION:
1. The class will be taken to a mock accident site.
a. Accident scene will have physical evidence present, vehicles, debris, etc.
b. Each student will demonstrate to the instructor's satisfaction how to relocate designated objects at the scene.
(1) Each of the three methods shall be used.
(a) Coordination
(b) Triangulation
(c) Reference point
c. Each student will draw a field sketch to be submitted as prescribed by the instructor.

SUGGESTED REFERENCES:

1. Baker, J. Stannard. *Traffic Accident Investigator's Manual for Police*. Evanston, Illinois: The Traffic Institute, Northwestern University, 1971.
2. California Highway Patrol Manual. *Accident Investigation*. Sacramento, California, 1971.

FIGURE 7

Highway Traffic Accident Investigation and Reporting
Job Activity Sheet

Lesson 24: Make Relocation Measurements

Student Name: _____

Instructor: _____

Assigned Activities	Student Description of Activity As Performed (attach necessary evidence)	Date Completed	Instructor Comments and Evaluation
1. Submit one example each, identifying if the measurements at an accident are of positions which are: a. Temporary in nature b. Long-lived in nature Explain why. 2. Submit three field sketches made at simulated or at actual accident scenes, demonstrating the use of each of the following methods for making relocation measurements including from what point and to where they should be made. a. Coordinate b. Triangulation c. Reference point Briefly describe why the particular method was selected for each example.			

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HIGHWAY SAFETY PROGRAM STANDARD No. 18

Accident Investigation and Reporting
U.S. Department of Transportation
National Highway Traffic Safety Administration

I. Scope. This standard establishes minimum requirements for a State highway safety program for accident investigation and reporting.

II. *Purpose.* The purpose of this standard is to establish a uniform, comprehensive motor vehicle traffic accident investigation program for gathering information—who, what, when, where, why, and how—on motor vehicle traffic accidents and associated deaths, injuries, and property damage; and entering the information into the traffic records system for use in planning, evaluating, and furthering highway safety program goals.

III. *Definitions.* For the purpose of this standard the following definitions apply:

Accident—an unintended event resulting in injury or damage, involving one or more motor vehicles on a highway that is publicly maintained and open to the public for vehicular travel.

Highway—the entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use

bility for the investigation of accidents and subsequent processing of resulting data.

5. Each State shall establish procedures for entering accident information into the statewide traffic records system established pursuant to Highway Safety Program Standard No. 10, Traffic Records, and for assuring uniformity and compatibility of this data with the requirements of the system, including as a minimum:

a. Use of uniform definitions and classifications acceptable to the National Highway Traffic Safety Administration and identified in the Highway Safety Program Manual.

b. A standard format for input of data into the statewide traffic records system.

c. Entry into the statewide traffic records system of information gathered and submitted to the responsible State agency.

B. *Accident reporting.* Each State shall establish procedures which require the reporting of accidents to the responsible State

2. In all other accidents, the drivers or owners of motor vehicles involved shall be required to immediately notify the police of the jurisdiction in which the accident occurred. This includes, but is not limited to accidents involving: (1) fatal or nonfatal personal injury, or (2) damage to the extent that any motor vehicle involved cannot be driven under its own power, in its customary manner, without further damage or hazard to itself, other traffic elements, or the roadway, and therefore requires towing.

D. *Accident investigation.* Each State shall establish a plan for accident investigation and reporting which shall meet the following criteria:

1. Police investigation shall be conducted of all accidents as identified in section IV.C.2 above. Information gathered shall be consistent with the police mission of detecting and apprehending law violators, and shall include, as a minimum, the following:

a. Violation(s), if any occurred, cited by section and subsection numbers and titles of the State

a. Locations that have a similarity of design, traffic engineering characteristics, or environmental conditions, and that have a significantly large or disproportionate number of accidents.

b. Motor vehicles or motor vehicle parts that are involved in a significantly large or disproportionate number of accidents or injury-producing accidents.

c. Drivers, pedestrians, and vehicle occupants of a particular age, sex, or other grouping, who are involved in a significantly large or disproportionate number of motor vehicle traffic accidents or injuries.

d. Accidents in which causation or the resulting injuries and property damage are not readily explainable in terms of conditions or circumstances that prevailed.

e. Other factors that concern State and national emphasis programs.

V. *Evaluation.* The program shall be evaluated at least annually by the State. Substance of the evaluation report shall be guided by Chapter V of the Highway

of the public for purposes of vehicular travel.

Motor vehicle—any vehicle driven or drawn by mechanical power manufactured primarily for use on the public streets, roads, and highways, except any vehicle operated exclusively on a rail or rails.

IV. *Requirements.* Each State, in cooperation with its political subdivisions, shall have an accident investigation program meeting the requirements established herein.

A. *Administration.* 1. There shall be a State agency having primary responsibility for administration and supervision of storing and processing accident information, and providing information needed by user agencies.

2. There shall be employed at all levels of government adequate numbers of personnel, properly trained and qualified, to conduct accident investigations and process the resulting information.

3. Nothing in this standard shall preclude the use of personnel other than police officers, in carrying out the requirements of this standard in accordance with laws and policies established by State and or local governments.

4. Procedures shall be established to assure coordination, cooperation, and exchange of information among local, State, and Federal agencies having responsibility for accident investigation.

B. *Reporting.* 1. Each State shall require the submission to a State agency within a reasonable time after occurrence.

C. *Owner and driver reports.* 1. In accidents involving only property damage, where the vehicle can be normally and safely driven away from the scene, the drivers or owners of vehicles involved shall be required to submit a written report consistent with State reporting requirements, to the responsible State agency. A vehicle shall be considered capable of being normally and safely driven if it does not require towing and can be operated under its own power, it is customary manner, without further damage or hazard to itself, other traffic elements, or the roadway. Each report so submitted shall include, as a minimum, the following information relating to the accident:

a. Location.
b. Time.
c. Identification of driver(s).
d. Identification of pedestrian(s), passenger(s), or pedal-cyclist(s).
e. Identification of vehicle(s).
f. Direction of travel of each unit.
g. Other property involved.
h. Environmental conditions existing at the time of the accident.
i. A narrative description of the events and circumstances leading up to the time of impact, and immediately after impact.

code, that (1) contributed to the accident where the investigating officer has reason to believe that violations were committed regardless of whether the officer has sufficient evidence to prove the violation(s); and (2) for which the driver was arrested or cited.

b. Information necessary to prove each of the elements of the offense(s) for which the driver was arrested or cited.

c. Information, collected in accordance with the program established under Highway Safety Program Standard No. 15, Police Traffic Services, section I-D, relating to human, vehicular, and highway factors causing individual accidents, injuries, and deaths, including failure to use safety belts.

2. Accident investigation teams shall be established, representing different interest areas, such as police; traffic; highway and automotive engineering; medical, behavioral, and social sciences. Data gathered by each member of the investigation team should be consistent with the mission of the member's agency, and should be for the purpose of determining probable causes of accidents, injuries, and deaths. These teams shall conduct investigations of an appropriate sampling of accidents in which there were one or more of the following conditions.

Safety Program Manual. The National Highway Traffic Safety Administration shall be provided with a copy of the evaluation report.

Student Opinion of Teaching and Course*

Date _____

Instructor _____

Characteristics of the Instructor

Each of the items below deals with a characteristic of instructors which students feel to be important. Indicate your rating of your instructor by a check at the appropriate point on the scale. The exact point at which you rate is less important than the general impression.

Example:

_____

NOT HELPFUL ACTIVELY HELPFUL

Write in after the question any additional comments that you wish to make. Give examples wherever possible.

1. Is the instructor actively helpful when students have difficulty?

   _____

   NOT HELPFUL ACTIVELY HELPFUL
   Examples or Comments:

2. Does the instructor appear sensitive to students' feelings and problems?

   _____

   UNAWARE RESPONSIVE
   Examples or Comments:

3. Is the instructor flexible?

   _____

   RIGID FLEXIBLE
   Example or Comments:

4. Does the instructor make students feel free to ask questions, disagree, express their ideas, etc.?

   _____

   INTOLERANT ENCOURAGES STUDENT IDEAS
   Example or Comments:

*Adapted from: Wilbert J. McKeachie, *Teaching Tips, A Guidebook for the Beginning College Teacher* (Lexington, Mass.: D.C. Heath and Company, 1969), pp. 247-252.
Based on an evaluation form used by the Department of Psychology at the University of Michigan.

5. Is the instructor fair and impartial in his dealings with the students?

FAVORS SOME — FAIR
Example or Comments:

6. Is the instructor's speech adequate for teaching?

UNINTELLIGIBLE — GOOD
Example or Comments: (Volume, Tone, Enunciation, Rate, Vocabulary, etc.)

7. Does the instructor belittle students?

BELITTLES — RESPECTS
Example or Comments:

8. Does the instructor tell students when they have done particularly well?

NEVER — ALWAYS
Example or Comments:

9. Does the instructor dwell upon the obvious?

DWELLS ON OBVIOUS — INTRODUCES INTERESTING IDEAS
Example or Comments:

10. Is the instructor interested in the subject of accident investigation?

SEEMS UNINTERESTED — SEEMS INTERESTED
Example or Comments:

11. Does the instructor use enough examples or illustrations to clarify the material?

NONE — MANY
Example or Comments:

12. Does the instructor present material in a well-organized fashion?

DISORGANIZED — WELL-ORGANIZED
Example or Comments:

13. Does the instructor follow an outline or a lesson plan to accomplish objectives?

NOT AT ALL — VERY CLOSELY
Example or Comments:

14. Does the instructor stimulate thinking?

_____

DULL STIMULATING

Example or Comments:

15. Does the instructor put his material across in an interesting way?

_____

DULL VERY INTERESTING

Example or Comments:

16. Other important characteristics—please specify.

Considering all of the above qualities which are applicable (including those that you added) how would you rate this instructor?

EXCELLENT VERY GOOD GOOD FAIR POOR VERY BAD

Now go back over the list and place a check (X) before the five items which were most important to you in making your judgement.

BIBLIOGRAPHY

The references listed in the *Course Guide* include only a limited number of selections that are available to give prospective administrators, planners, and instructors an insight into the field of accident investigation. Items are those selected from the extensive collection resulting from contract DOT-HS-115-1-169. The following are recommended as being of particular interest to administrators of highway traffic safety agencies and training institutions who contemplate initiating the Accident Investigation and Reporting: Basic Course.

More extensive reference lists for accident investigation are included in the *Instructor's Lesson Plans* and the *Student Study Guide*.

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